RESTRICTED CIRCULATION

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Agricultural Memorandum No 771
Sugar Beet Yields - Ely. 1945 - 57

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Following the lines of the analysis of Ag. Mem 770 the following interim report was written in June 1959.

If the data are analysed in the form of a triple regression with variables.

I improvement factor (years after 1945)
ET estimated (effective) transpiration
H potential transpiration in August and September (a heat factor)

then it is found

$$\text{Yield} = 0.275\,I + 0.64\,ET + 1.0H - 4.4$$

with a multiple correlation of 0.84, and partial correlations 0.74, 0.76 and 0.34 respectively, but large errors were still apparent in 1954 and 1956.

The first attempt on the data for the Ely factory (supplied under 'confidential' promise!) by B.S.C. lead to the following:

Year	Yield	Yield less 2% per year	Estimated Transpiration
1945	9.69	9.7	14.3
1946	10.90	10.7	16.9
1947	7.99	7.7	10.4
1948	10.48	10.2	15.8
1949	9.9	9.1	12.3
1950	12.81	11.5	16.6
1951	11.16	9.9	15.4
1952	10.73	9.2	12.2
1953	13.81	11.6	16.2
1954	9.90	8.1	14.6
1955	10.35	8.2	11.3
1956	13.51	10.5	13.6
1957	11.46	8.8	14.0
	tons/acre		inches

The correlation between the last two columns is 0.8, which rises to 0.88 if you ignore 1954.

The regression was

$$\text{Adjusted yield} = 2.7 + \tfrac{1}{2}\,(\text{Estimated Transpiration})$$

which gave results with an average error of 0.7 tons/acre. The greatest errors were 1954 and 1957 (too high) and 1956 (too low).

The 1957 might be a yellow effect but I do not see any reason for 1954; 1956 might be a result of no rabbits?

Any comments or suggestions on this paper should be referred to the author.

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